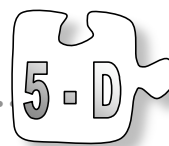


### 3.2.1 How can I draw it?

#### Describing Relationships Between Quantities



You may not know it, but you use mathematical thinking every day. You think mathematically when you figure out if you can afford items you want to buy, or when you read a graph on a web page. You also think mathematically when you double a recipe or when you estimate how much longer it will take to get somewhere based on how far you still have to go. Math can describe many of the relationships in the world around you.

Building your interpretation skills and developing ways to represent situations will help you solve problems. In this section you will learn new ways to show your thinking when using math to solve problems. As you work today, think about the following questions:

How can I represent this with a diagram?

Who has more? Who has less?

- 3-54. Sometimes using the same words in a slightly different way can change their meaning. Read and compare the two situations below.

#### Situation 1

Myra has 15 marbles. This is ten less than Dahlia.

#### Situation 2

Myra has 15 marbles. Dahlia has ten less than Myra.

- For each situation, draw a picture to represent the marbles each girl has. What is the difference between the problems?
- In which problem does Myra have more marbles than Dahlia?
- How many marbles does Dahlia have in Situation 1 above? How many does she have in Situation 2?

- 3-55. Ellie is building a dollhouse. She has boards that are two different lengths. One long board is 7 inches longer than the total length of three of the short boards.

- Draw a picture showing how the short and long boards are related.
- What are some possible lengths of her boards?
- If one of the long boards is 50 inches long, how long is a short board? Be ready to share your thinking with the class.



- 3-56. Now read and compare Problems A and B below.

Problem A

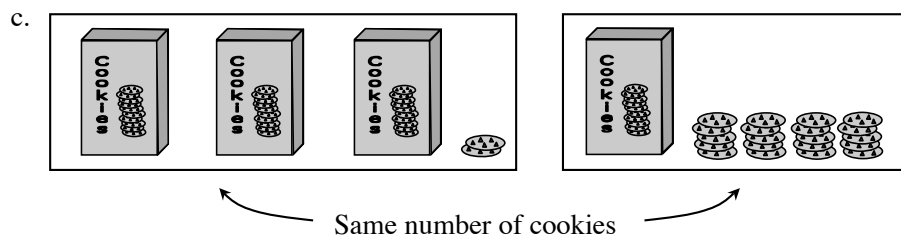
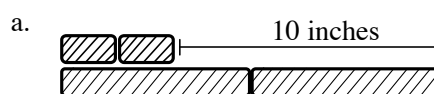
Dianna has \$16. Jairo has twice as much money as Dianna. Who has more money?

Problem B

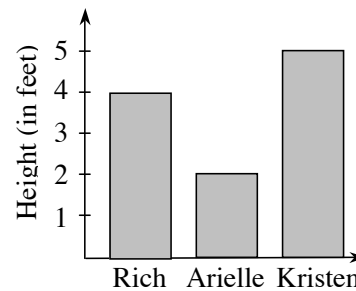
Dianna has \$16. She has twice as much money as Jairo. Who has more money?

- Represent each problem with a diagram.
- Compare the amount of money Jairo has in part (a) to the amount he has in part (b). Explain how you know in which situation he has more money.

- 3-57. Now you are going to **reverse** your thinking. Examine the pictures below, then use words to describe the relationship you see in the pictures. Assume the lengths that appear to be equal are equal.



- 3-58. Richard, Arielle and Kristen just measured how tall they are in feet. Their heights are shown in the bar graph at right.



Decide which statements below are true and which statements are false. Rewrite the false statements to make them true.

- Richard is one foot shorter than Kristen.
- Arielle is twice as tall as Richard.
- Kristen is one foot taller than twice Arielle's height.
- The sum of the three children's height is 10 feet.

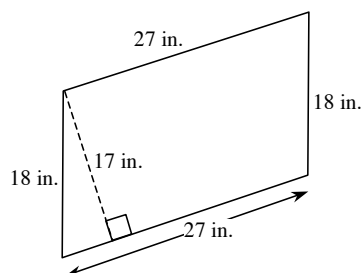
- 3-59. **Additional Challenge:** Represent this description with a picture.

Ellen is gluing tiles on the four vertical sides of a rectangular planter box. The longer side of the box is covered by six more than two times as many tiles as the shorter side.

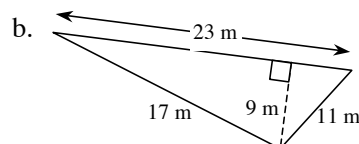


- 3-60. Find the area of each figure below.

a.



b.



3-61. Find the missing information from the following relationships.

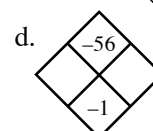
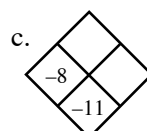
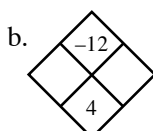
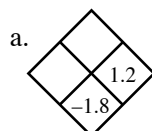
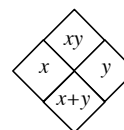
- Mark has downloaded four times as many songs on his music player as Chloe. If Mark has 440 songs, how many songs does Chloe have?
- Cici likes to collect shoes, but she only has half the number of pairs of shoes that her friend Aubree has. If Cici has 42 pairs of shoes, how many pairs of shoes does Aubree have?
- Tito walked three more miles than Danielle. If Danielle walked 2 miles, how far did Tito walk?



3-62. Evaluate the expression  $10 - 2x$  for the given  $x$ -values.

- $x = 2$
- $x = \frac{1}{2}$
- $x = -2$

3-63. Copy and complete each of the Diamond Problems below. The pattern used in the Diamond Problems is shown at right.



3-64. Complete a Portions Web, described in Lesson 1.1.5, for each number below.

- 0.25
- $\frac{3}{4}$
- $33\frac{1}{3}\%$

